

REMARKS

Claims 1-2, 7-8, 15, 18-20, 22-26 and 29-37 are pending.

Claims 3-6, 9-14, 16, 17, 21 and 27-28 have been cancelled, without prejudice.

In the Office Action dated January 15, 2010, claim 21 was rejected under 35 U.S.C. § 112, ¶ 2; claim 1 was rejected on the grounds of nonstatutory obviousness-type double patenting as unpatentable over claim 1 of U.S. Patent No. 7,093,147 in view of Kumar (“Processor Power Reduction Via Single-ISA Heterogeneous Multi-Core Architectures”); claim 7 was rejected on the ground of nonstatutory obviousness-type double patenting as unpatentable over claim 14 of U.S. Patent 7,093,147 over Calder (U.S. Patent Publication No. 2004/0111708); claims 1-2, 17, 19, 22, 32, and 34 were rejected under 35 U.S.C. § 102(a) as anticipated by Kumar; claims 7-8, 15, 18, 24, 29-30, and 37 were rejected under 35 U.S.C. § 103(a) as unpatentable over Kumar in view of Calder; claims 20-21 and 33 were rejected under 35 U.S.C. § 103(a) as unpatentable over Kumar; claims 23 and 31 were rejected as unpatentable over Kumar in view of Calder and further in view of Nagae (U.S. Patent No. 6,006,248); claims 25-26 and 35-36 were rejected under 35 U.S.C. § 103(a) as unpatentable over Kumar in view of Paker (“A heterogeneous multi-core platform for low power signal processing in systems-on-chip”); claims 1-2, 7-8, 15, 17-19, 22, 24, and 32-34 were rejected under 35 U.S.C. § 102(a) as anticipated by Calder; claims 20-21, 29-30, and 37 were rejected under 35 U.S.C. § 103(a) as unpatentable over Calder; claims 23 and 31 were rejected under 35 U.S.C. § 103(a) as unpatentable over Calder in view of Nagae; and claims 25-26 and 35-36 were rejected under 35 U.S.C. § 103(a) as unpatentable over Calder in view of Paker.

REJECTION UNDER 35 U.S.C. § 112, ¶ 2

Claim 21 has been cancelled to render the rejections of the claim moot.  
Withdrawal of the § 112, ¶ 2, rejection is respectfully requested.

OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTION

In view of the Terminal Disclaimer over U.S. Patent No. 7,093,147, withdrawal of the obviousness-type double patenting rejection of claims 1 and 7 over U.S. Patent No. 7,093,147 in view of Kumar or Calder is respectfully requested.

The Terminal Disclaimer is submitted without making any concession regarding the correctness or propriety of the obviousness-type double patenting rejections.

REJECTION UNDER 35 U.S.C. § 102 OVER KUMAR

Independent claim 1 and its dependent claims were rejected as purportedly anticipated by Kumar, which is printout of a web page from portal.acm.org containing an Abstract of a paper by Rakesh Kumar et al. Kumar purports to have a publication date of January 2002.

As established by the Second Declaration under 37 C.F.R. § 1.132, enclosed herewith, it is clear that the 2002 publication date for the Abstract contained in Kumar is in error. *See* Second Declaration under 37 C.F.R. § 1.132, ¶¶ 14-17.

As established by the Second Declaration under 37 C.F.R. § 1.132, it would not be possible for the Abstract of Kumar to have been published in 2002, since the corresponding paper by Rakesh Kumar et al., entitled "Processor Power Reduction by a Single-ISA Heterogeneous Multi-Core Architectures," was not submitted to the publication entity of the IEEE Computer Architecture Letters until March 2003. *Id.*, ¶¶ 14, 17. Moreover, the inventors also state in the Second Declaration under 37 C.F.R. § 1.132 that any Abstract relating to the above-referenced paper was not submitted to any publication entity for publication in 2002, and thus, the Abstract contained in Kumar could not have been published in 2002.

Since the "2002" publication date attributed to the Abstract contained in Kumar is in error, Kumar does not constitute prior art under 35 U.S.C. § 102(b) against the present application. Moreover, since the Abstract contained in Kumar contains content of the

above-referenced paper, as stated in ¶ 14 of the Second Declaration under 37 C.F.R. § 1.132, the Abstract of Kumar does not constitute prior art under any other section of 35 U.S.C. § 102.

In view of the foregoing, withdrawal of the § 102 rejection of the claims over Kumar is respectfully requested.

#### REJECTION UNDER 35 U.S.C. § 102 OVER CALDER

It is respectfully submitted that the rejection of claim 1 over Calder is erroneous. Note that Calder has a filing date of September 9, 2003, which is **after** the filing date of the present application (July 16, 2003).

Calder claims the benefit of the following two provisional applications, each having a filing date of September 9, 2002: provisional applications Serial Nos. 60/409,105 (hereinafter “‘105 Provisional Application”), and 60/409,106 (hereinafter “‘106 Provisional Application”).

However, the ‘105 Provisional Application and the ‘106 Provisional Application do not contain content of Calder relied upon by the Office Action in rendering all rejections based on Calder. Specifically, the rejection of claim 1 relied upon ¶ [0049] of Calder, which refers to a single ISA architecture that has several heterogeneous cores. Paragraph [0049] of Calder also states that the resource requirements of the program during execution are determined on a per phase basis. Paragraph [0049] of Calder also states that the resource requirements determine which of the multi-core architectures a given phase should run on. According to ¶ [0049] of Calder, the phase classification guides each phase of the program execution to a specific core.

The content of ¶ [0049] of Calder is not supported by either the ‘105 Provisional Application or ‘106 Provisional Application. Copies of both the ‘105 and ‘106 Provisional Applications are attached herewith. A thorough review of the ‘105 Provisional Application indicates that there is no reference in the ‘105 Provisional Application to any one of the following concepts: heterogeneous cores, multi-core architecture, or guiding each phase of program execution to a specific core.

The ‘106 Provisional Application also does not provide any discussion of the content of ¶ [0049] of Calder. The ‘106 Provisional Application refers to a technique for

tracking a metric to classify phases of a program, and to predict program phases. ‘106 Provisional Application, pages 1-2. As stated on page 5 of the ‘106 Provisional Application, the content of the ‘106 Provisional Application includes a “unified phase tracking architecture” and a “phase change prediction architecture.” Section 5 on pages 10-18 of the ‘106 Provisional Application describe an architecture for capturing phases, such that phases of a program can be classified. Section 6 of the ‘106 Provisional Application on pages 19-21 describe predicting a next phase that is to occur.

Section 5.4 on page 15 of the ‘106 Provisional Application states that “phase classifications on programs at run-time [have] little to no impact on the design of the processor core.”

However, nowhere in the ‘106 Provisional Application is there any discussion regarding a phase classification that guides each phase of the program execution to a specific core of a multi-core architecture that has several heterogeneous cores, as stated in ¶ [0049] of Calder.

Therefore, at least ¶ [0049] of Calder clearly constitutes material added to Calder that did not exist in either the ‘105 or ‘106 Provisional Applications. Therefore, at least ¶ [0049] of Calder has a priority date of September 9, 2003, which is after the filing date of the present application.

Thus, at least ¶ [0049] of Calder does not constitute prior art against the present application. In view of the foregoing, withdrawal of the § 102 rejection of the claims over Calder is respectfully requested, since the rejection is based on content of Calder not entitled to the September 9, 2002 filing date of the ‘105 and ‘106 Provisional Applications.

The other passage of Calder relied upon by the Office Action in the rejection of claim 1 is the Abstract of Calder. The Abstract of Calder refers to tracking a statistic for a component, and using the tracked statistic to identify a behavior of a program over each of multiple intervals of execution. The Abstract further notes that the behavior of the interval is compared to the behavior of another interval of execution to find similar sections of behavior. Calder, Abstract. There is nothing in the Abstract of Calder that provides any hint of heterogeneous computer processor cores that are configured to execute the same instruction set, or a performance measurement and transfer mechanism

configured to move executing computer processing jobs amongst the plurality of computer processor cores by matching requirements of the plurality of executing computer processing jobs to processing capabilities of the computer processor cores.

Claim 1 is therefore clearly allowable over Calder.

The rejection of independent claim 7 over Calder also relies upon ¶ [0049] of Calder, which finds no support whatsoever in the '105 and '106 Provisional Applications from which Calder claims priority. Therefore, since ¶ [0049] does not have a priority date that pre-dates the filing date of the present application, the rejection of claim 7 over Calder is also erroneous.

The other passages of Calder relied upon by the Office Action against claim 7 include ¶ [0055], claim 51, and the Abstract of Calder. The Abstract of Calder provides no hint whatsoever of transferring individual ones of a plurality of computer processing jobs amongst targeted ones of the plurality of computer processor cores based on a throughput metric, where the plurality of computer processor cores are on a single semiconductor die, and where at least two computer processor cores differ in processing capability.

Claim 51 of Calder refers to using a statistic to perform one of a behavior optimization, statistic optimization, load-time optimization, run-time optimization, and hardware reconfiguration. However, there is no hint here of the “transferring” element of claim 7, in the context of computer processor cores at least two of which differ in processing capability and are on a single semiconductor die.

Paragraph [0055] of Calder describes tracking a statistic for components, where the statistic is a hardware metric and/or hardware-independent metric. However, no mention is made in ¶ [0055] of performing the transforming recited in claim 7.

In view of the foregoing, it is clear that claim 7 is also allowable over Calder.

#### REJECTION UNDER 35 U.S.C. § 103 OVER KUMAR AND CALDER

Independent claim 7 was also rejected as purportedly obvious over Kumar and Calder. Since Kumar does not constitute prior art against the present application, as discussed above in connection with claim 1, it is respectfully submitted that the obviousness rejection of claim 7 over Kumar and Calder has been overcome.

Moreover, ¶ [0049] of Calder, relied upon in the rejection of claim 7 over Kumar and Calder, is not supported by the '105 and '106 Provisional Applications and therefore does not qualify as prior art against the present application; therefore, the § 103 rejection is defective for this additional reason. Moreover, it is also clear that the other passages of Calder, ¶ [0055] and claim 51, relied upon in the rejection also provides no hint of the "transferring" element of claim 7, as discussed above in connection with the § 102 rejection of claim 7 over Calder.

Independent claim 29 was also rejected as purportedly obvious over Kumar and Calder. Claim 29 is allowable over Kumar and Calder for similar reasons as stated above with respect to claim 7.

#### REJECTION UNDER 35 U.S.C. § 103 OVER KUMAR

Independent claim 20 was rejected as purported obvious over Kumar alone. Since Kumar does not constitute prior art against the present application, withdrawal of the § 103 rejection of claim 20 over Kumar is respectfully requested.

With respect to claim 20, the Office Action conceded that Kumar fails to disclose building a data structure with relative performances of jobs on different types of computer processor cores. Instead, the Office Action made a conclusory statement such building of a data structure would have been obvious. 01/15/2010 Office Action at 15. Such a conclusory statement is not supported by any evidence cited by the Office Action, and therefore, the obviousness rejection is further defective on this additional ground.

#### REJECTION UNDER 35 U.S.C. § 103 OVER KUMAR AND PAKER

The obviousness rejection of independent claim 25 over Kumar and Paker is defective for at least the reason that Kumar does not constitute prior art against the present application.

Therefore, claim 25 is non-obvious over Kumar and Paker.

#### REJECTION UNDER 35 U.S.C. § 103 OVER CALDER

In the rejection of independent claims 20 and 29 as purportedly obvious over Calder, the Office Action relied upon ¶ [0049] of Calder, which has a priority date that is

after the filing date of the present application, and therefore, ¶ [0049] of Calder does not constitute prior art against the present application. Moreover, the other passages of Calder, including ¶¶ [0054] and [0055] of Calder, and claim 51 and the Abstract, do not provide any teaching or hint of a performance measurement and transfer mechanism configured to move a plurality of executing computer processing jobs amongst a plurality of computer processor cores based on a measured throughput metric, in which at least two of the computer processor cores differ in processing performance.

Moreover, the Office Action conceded that Calder fails to disclose building a data structure with relative performances of jobs on different types of computer processor cores. 01/15/2010 Office Action at 24. The Office Action argued that such a feature would have been obvious, without providing any objective evidence to support this conclusory allegation. It is respectfully submitted that the obviousness rejection is further defective since the Office Action has not cited to specific evidence to support an allegation of obviousness.

Independent claim 29 is similarly allowable over Calder for the foregoing stated reasons.

#### REJECTION UNDER 35 U.S.C. § 103 OVER CALDER IN VIEW OF PAKER

Since ¶ [0049] of Calder, relied upon by the Office Action in the rejection of independent claim 25 over Calder and Paker, is not entitled to a priority date that pre-dates the filing date of the present application, ¶ [0049] does not qualify as prior art, and therefore, the obviousness rejection of claim 25 over Calder and Paker is defective for at least this reason.

#### CONCLUSION

Dependent claims are allowable for at least the same reasons as corresponding independent claims. Moreover, the remaining obviousness rejections are also further defective based on the statements above that Kumar and at least ¶ [0049] of Calder do not constitute prior art against the present application.

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Reply to Office Action of January 15, 2010

The Commissioner is authorized to charge any additional fees and/or credit any overpayment to Deposit Account No. 08-2025 (200210109-1).

Respectfully submitted,

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